SERVICE MANUAL

# TT 420

marantz®

Model TT 420

Turntable

## FEATURES

Full-automatic, direct drive with cueing, strobe, pitch control, record size selector, speed selector, repeat, start/stop and dual suspension cabinet.

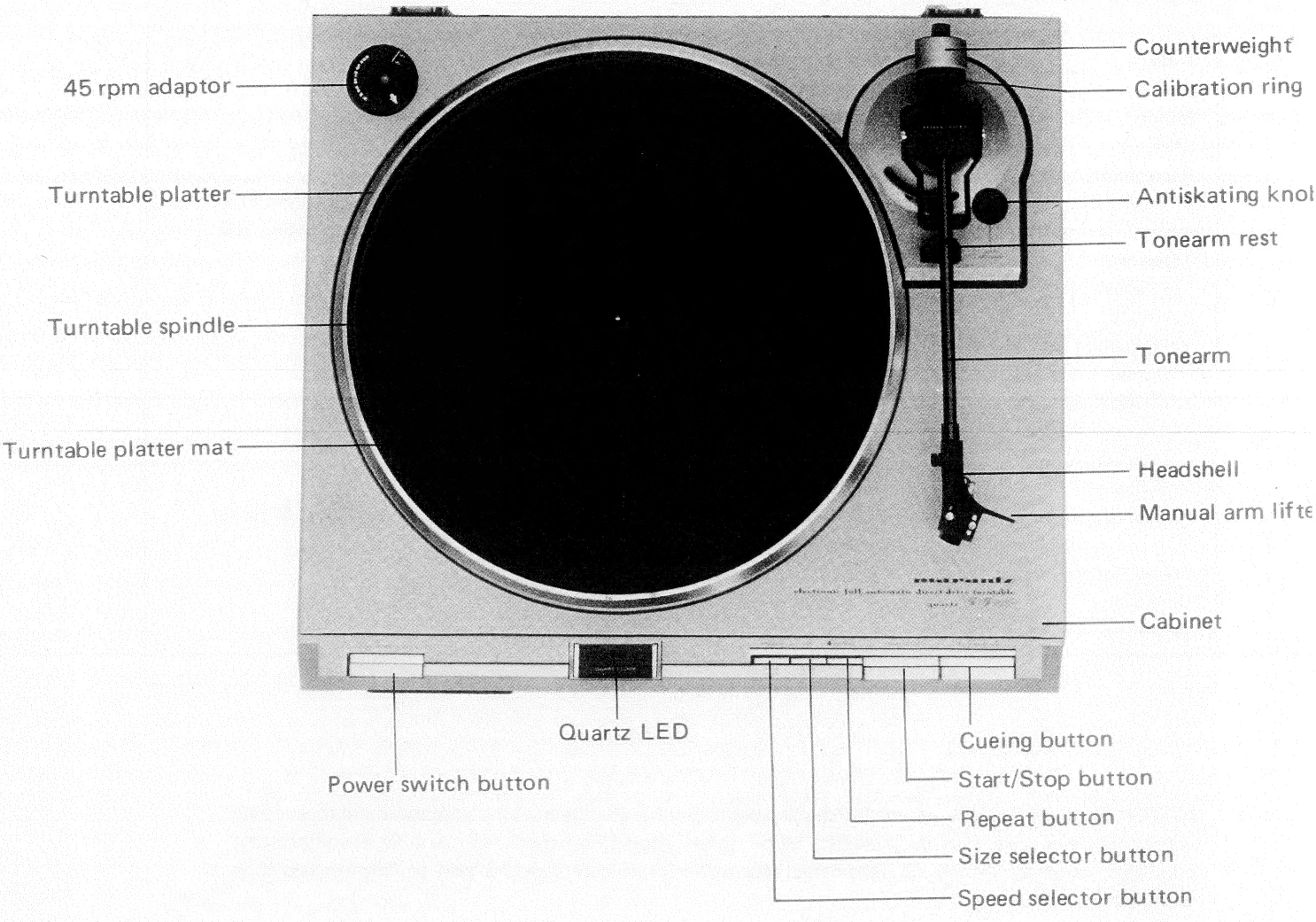
### SPECIFICATIONS:

| | |
|---|---|
| Type | 2 speeds, direct drive, full-automatic turntable |
| Platter | Aluminum alloy die-cast, 310mm diameter |
| Motor | 4 phase, 8 pole magnetic field withi PLL coreless DC |
| Speed | 2 speeds; 33-1/3 and 45 rpm |
| Pitch control range | ±3% or more |
| S/N (DIN B) | 60dB or more, Test record: DN45544, Test equipment: by DIN45539 |
| Wow & Flutter (DIN CCIR) | 0.13% or less, Test record: DIN45545, Test equipment: by DIN45500 |
| Tonearm | |
| Effective length | 214±2mm |
| Cartridge | |
| Frequency response | 20 - 20,000Hz |
| Output voltage | 1.8 - 3.2mV at 1kHz, 3.54cm/sec, Test record: TRS-1004 |
| Channel differnce | 2 dB or less at 1kHz, Test record: TRS-1004 |
| Channel separation | 18dB or more at 1kHz, Test record: TRS-1004 |
| Tracking force | 2 gram+0.5, −0.3 gram |
| Stylus tip | 0.6mil diamond stylus |
| Power source | 110/120/220/240V 50/60Hz, 220V 50Hz for Europe, 240V 50Hz for UK and Australia |
| Power consumption | 9W±10% |
| Dimensions | 416(W) x 373(D) x 115(H) mm |
| Weight | 5.9kg |
| Accessories | 45 rpm adaptor |

**NOTE:** Nominal Specs represent the design specs; all units should be able to approximate these-some will exceed and some may drop slightly below these specs. Limit specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

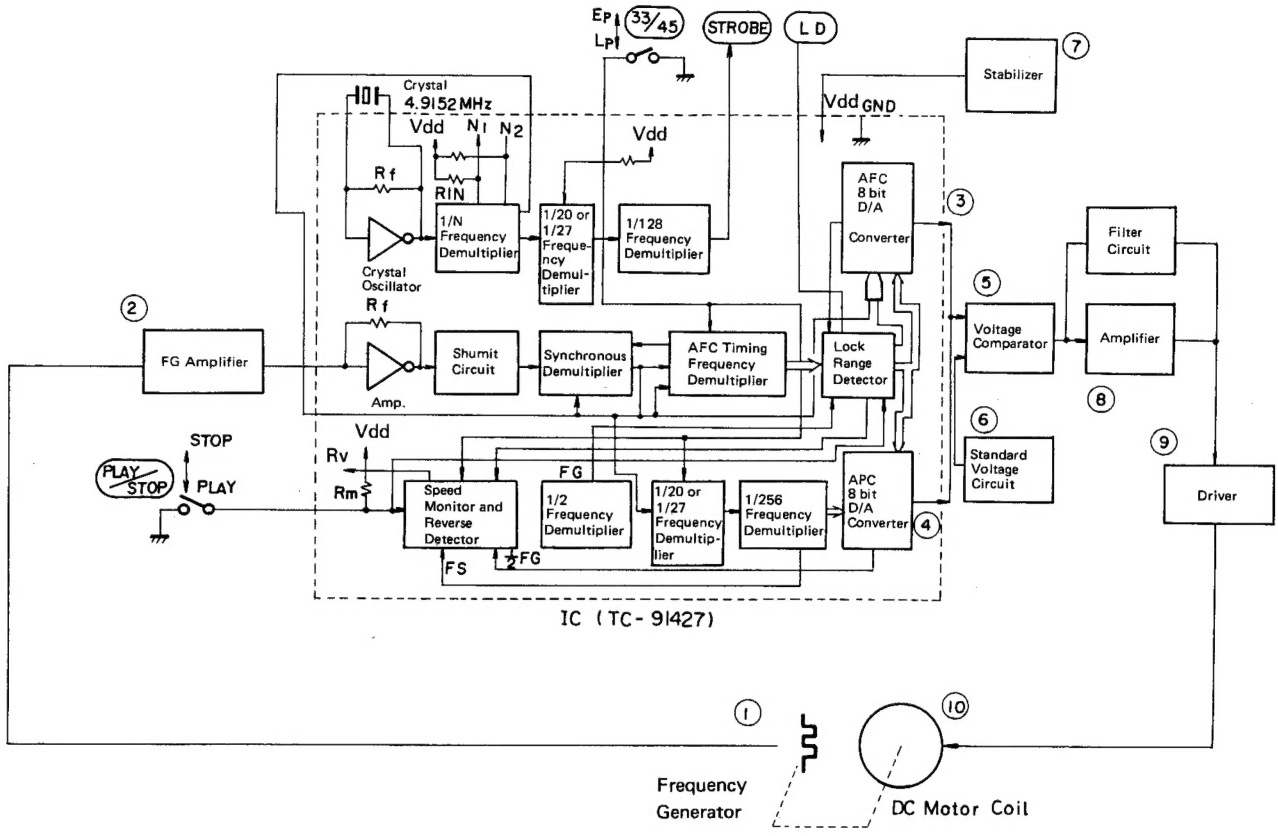
Lubrication of the mechanism is not required. However, whenever a unit is brought in for adjustment or repair, always use good common sense ... clean any dust or dirt from mechanical parts and if moving parts do seem to bind, check for dirt. If necessary, add a very fine film of light-weight specially formulated lubricant.

## DESIGNATION OF PARTS



## PRINCIPLE OF OPERATION FOR MOTOR

### 1. BLOCK DIAGRAM




**1) FG (Frequency Generator)**

FG generator is consist of a rotor which is dualy magnetized 8-pole and 160-pole, and all round integrated type FG pattern.

And it generates sine wave of 44.44 Hz at 33-1/3 rpm and 60.00 Hz at 45 rpm. amplified up to level of threshold voltage of schumit trigger.

**2) FG Amplifier**

To amplify output signal from FG.

**3) AFC output (Automatic frequency control output)**

To be consist of 8 bit of D/A converter which is frequency-voltage converter against FG frequency.

**4) APC output (Automatic phase control output)**

To be consist of 8 bit D/A converter which is phase comparator ($\phi$-V) to compare fai of phase difference between 1/2 FG and FS' standard frequency.

**5) Comparator**

To compare standard voltage and total of AFC output and APC output.

**6) Standard voltage circuit**

To divid resister of standard voltage of stabilizer.

**7) Stabilizer**

To supply constant voltage to IC.

**8) Amplifier**

To drive hole element of detecting the location of rotor.

**9) Driver**

To detect location of polarity magnetized on rotor by means of hole element and select the order of current to feed to 4-pole driving coil.

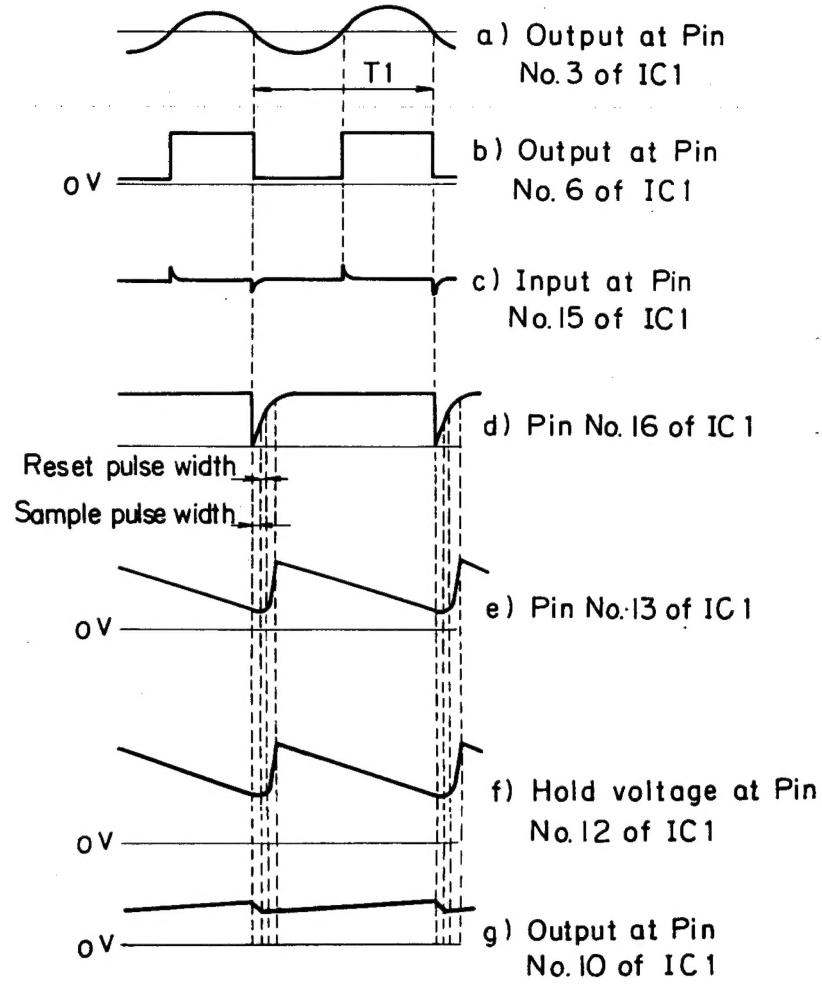
The current of hole element is controlled by servo circuit, and the output voltage of hole element is changed by rotary speed and phase change.

**10) Motor**

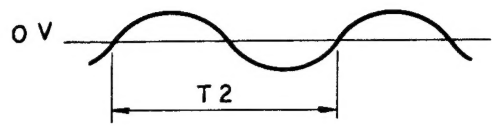
Coreless, slotless and flat type motor with 4-phase, half wave driving system.

## 2. TIMING CHART

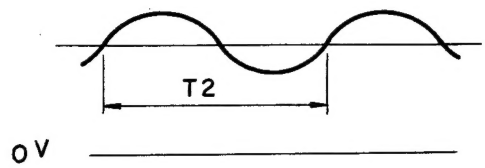
### 1) Control Section




### 2) Driving Section




1) Output Voltage of hole element between pin No. 7 and No. 9, or between No. 10 and No. 12.




2) Voltage between collector of X9 (X10, X11, X12) and ground.

## 3. ALIGNMENT METHOD

### 3-1. Speed alignment

1) Set changeover switch to 45 rpm.

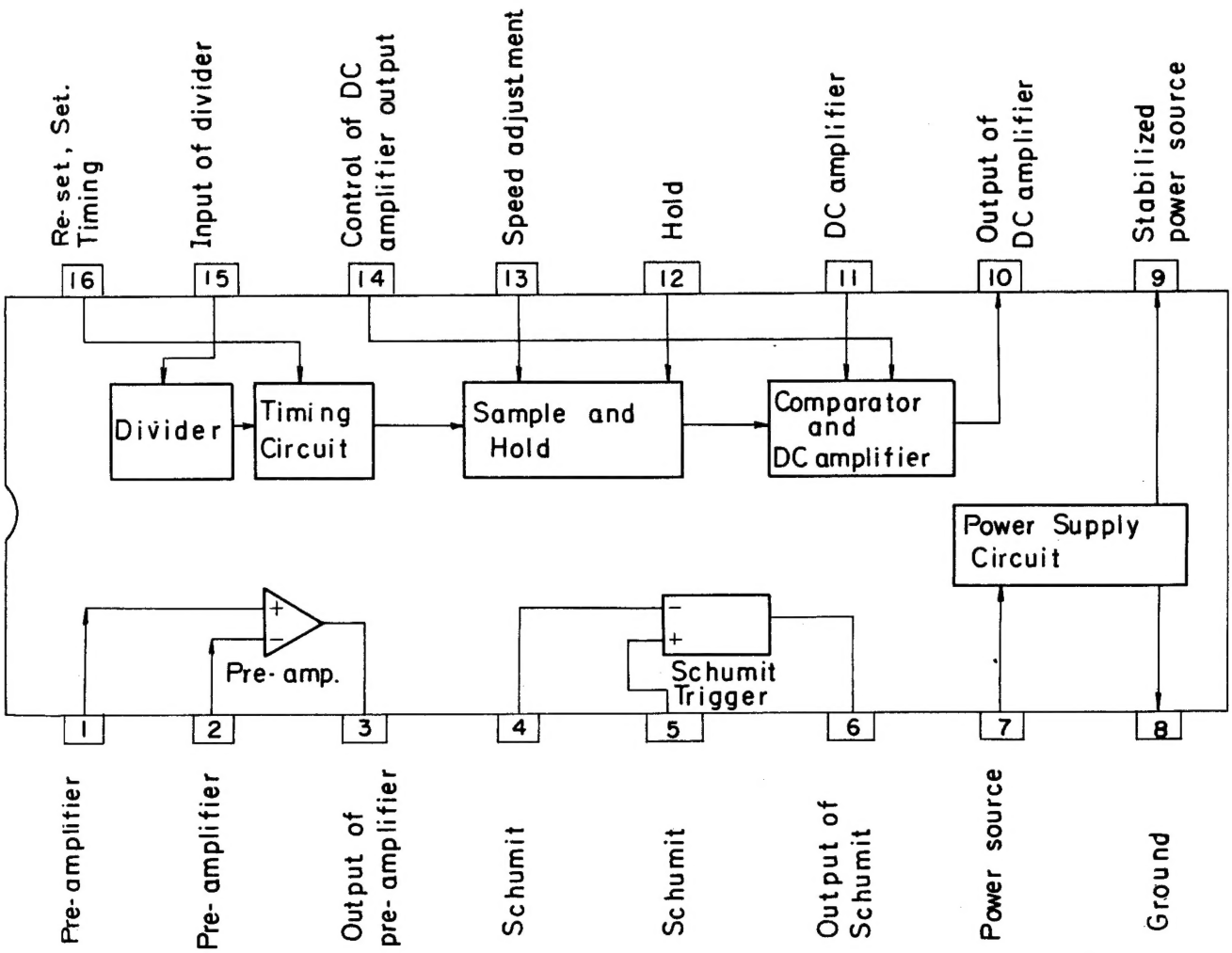
2) Set potentiometer(pitch control) to its center.

3) Set speed to 45 rpm by means of adjusting VR1(100 K ohm).

4) Set speed changeover switch to 33-1/3 rpm.

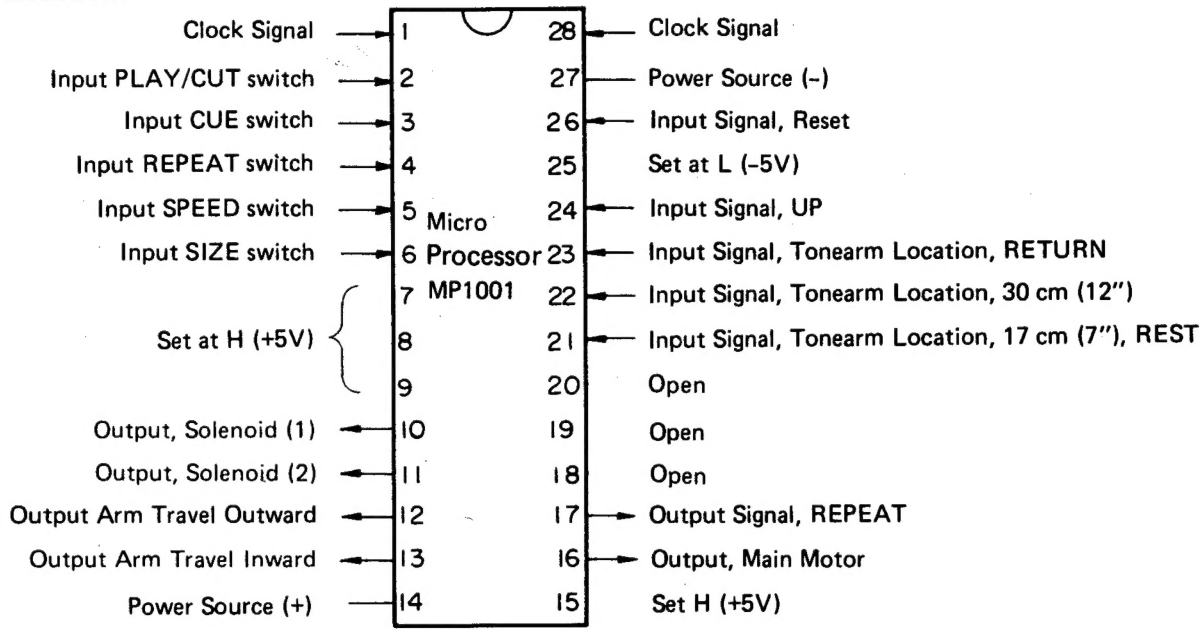
5) Set speed to 33-1/3 rpm by means of adjusting VR2(100 K ohm).

## 4. BLOCK DIAGRAM OF IC1 ($\mu$PC1043)



Micro Processor (IC101)

1. Pin Location:




All of the terminals are open drain.

2. Function of Pins:

1) Clock:

Clock input signal of microprocessor and oscillation frequency is about 400 kHz.

2) Input, PLAY/CUT switching:

Input level H (+5V) is accepted as PLAY signal at the rest position, also is accepted as CUT signal at posi tion other than rest.

3) Input, CUE switching:

Input H (+5V) sign is accepted as UP, DOWN signal by pressing CUE button.
But signal is interrupted when tonearm is at the rest position or in motion.

4) Input, REPEAT switching:

Input H (+5V) is accepted as REPEAT ON, or REPEAT OFF signal by pressing repeat button.

5) Input, SPEED switching:

Input H (+5V) is accepted as speed change signal by pressing speed change button.

6) Input, SIZE switching:

Input H (+5V) is read as 30 cm (12") and H (-5V) is read as 17 cm (7"), but the signal is accepted onl when the tonearm is traveling from the tonearm rest to lead-in point to start play.

7, 8, 9) No. 7, 8 and 9 are optional pins, not used and set at H (+5V).

10) Output (1), Solenoid:

To feed H (+5V) signal for tonearm down motion, and is opened for tonearm up motion.

11) Output (2), Solenoid:

To feed H (+5V) signal for only initial 1 sec., for the tonearm down motion, and it is opened in othe mode.

12) Output, Arm Travel Outward:

To feed H (+5V) signal for outward travel of tonearm in automatic mode, and also to feed H (+5V) as BRAKE signal to interrupt inward travel of the tonearm and at tonearm down motion.

13) Output, Arm Travel Inward:

To feed H (+5V) signal for inward travel of tonearm in automatic mode, and also to feed H (+5V) as BRAKE signal to interrupt outward travel of the tonearm and at tonearm down motion.

14) Power Source (+):

±5V is used as 10V power source.

15) No. 15 is optional pin, not used and the level is set at H (+5V).

16) Output, Main Motor ON/OFF:

To feed H (+5V) signal when PLAY input is applied and the tonearm is located other than at the rest position.

17) Output Signal, REPEAT:

To feed H (+5V) signal for REPEAT ON, and it is opened for REPEAT OFF.

18) No. 18 is optional pin, not used and opened.

19) No. 19 is optional pin, not used and opened.

20) No. 20 is optional pin, not used and opened.

21, 22, 23) Input Signal, Tonearm Location:

Same function as 2-1).

24) Input Signal, UP:

To read completion of tonearm lift motion by H (+5V) input signal.

25) No. 25 is optional pin, not used and set at L (-5V).

26) Input Signal, Reset:

To recover output signal to initial level by H (+5V) input signal.

To reset all modes to initial mode by input signal of H (+5V).

Initial mode means that the tonearm is located at the rest position and speed is 33 rpm.

27) Power Source (-):

±5V is used as 10V power source.

28) Clock Signal:

Clock input signal of microprocessor and oscillation frequency is about 400 KHz.

3. Rating:

| | |
|---|---|
| Power Source: | 10V ± 10% |
| Input Terminal: | H -- 8V or more<br>L -- 5.7V or less |
| Output Terminal: | Open drain, but provides additional PULL-DOWN resistors to the terminals. |

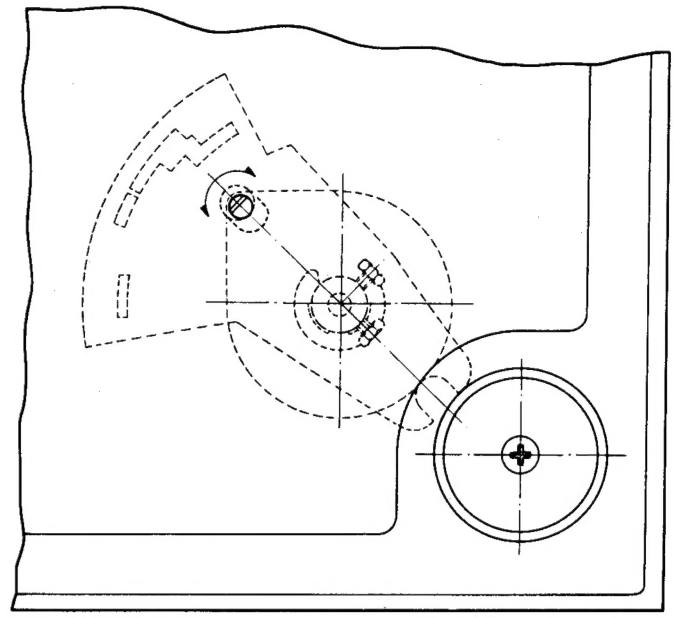


Fig. 1

## ADJUSTMENT OF LEAD IN ADJUSTMENT

Adjust disc lead-in dimention by turning the lead-in accentric pin on the feed arm assembly.
Turn accentric pin clockwise to adjust tonearm away from the disc and turn counter clockwise to move the tonearm toward the disc (fig. 1).
The position of automatic return is fixed automatically by lead-in adjustment.

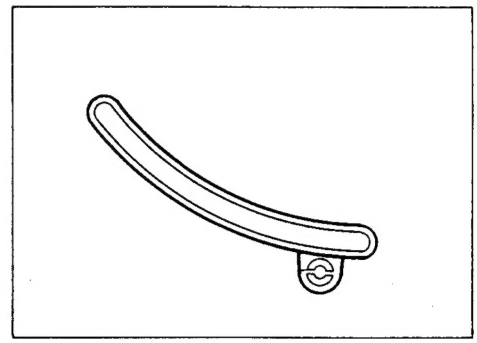


Fig. 2

## ADJUSTMENT OF STYLUS HEIGHT

Place a record on the platter and set the cueing button to▼. More the tonearm over the record. The stylus should clear the record by 5mm. This clearance can be adjusted, if necessary, with the screw on the cueing platform (fig.2) To increase the clearance, turn the screw counter-clockwise.
Your TT420 is equipped with an auto-return mechanism which returns the tonearm to the tonearm rest whenever the record is finished playing or if the STOP button is operated. Unless the clearance between stylus and record is properly adjusted, the tonearm will not return to the correct position of the arm rest and possibly fall onto the record surface thereby damaging it. Check for this possible problem after your unit is connected and operational. Return the tonearm to its rest and clamp it with locklever on the rest. Set the cueing button to▼.

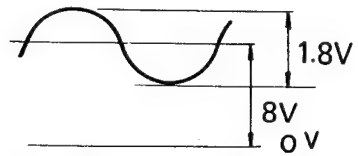
## ADJUSTMENT FOR SUB-CHASSIS LEVEL

The black screw on the bottom lid is pre-adjusted and fixed to keep sub-chassis level.

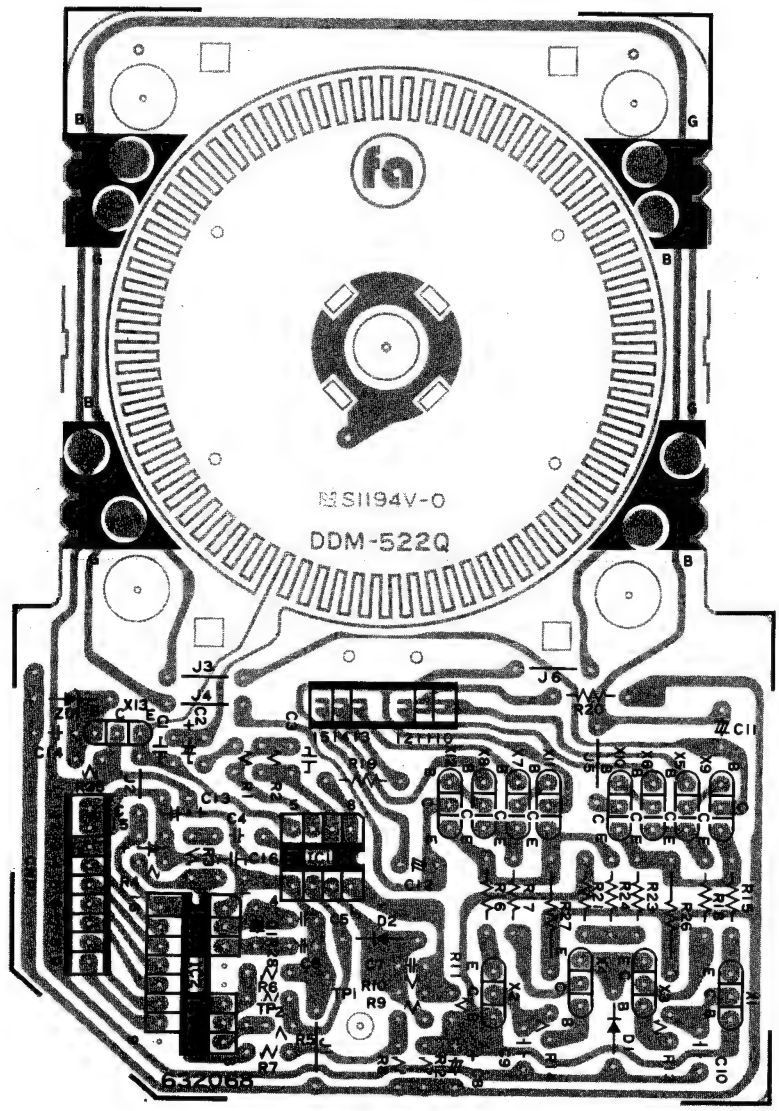
## TROUBLE SHOOTING

| Sympton | Cause | Repair |
|---|---|---|
| When power is on, the tonearm does not return to the arm rest. | No generation of differential input(high) on 26 pin of IC101. | Deffective R132, C110, D105. or mal-soldering. |
| | Micro computer does not oscillate. (to be observed at 1 pin or 28 pin) | Deffective L101, C109 or mal-soldering |
| When the tonear is on the arm rest, the turntable does not stop its rotation. | Collector of X107 is not Low. | |
| | Base of X107 is more than 0.6V. | Deffective X107. |
| | When Base of X107 is less than 0.3V, 6 pin of IC102 is Low. | Deffective IC102 |
| | When Base of X107 is less than 0.3V, 6 pin of IC102 is High. | To check wave form of 21, 22, 23 pins of IC101. |
| Tonearm does not move. | Voltage variation between No.1 and No.2 of CNP103. | Mal-contact of connector of CNP103. |
| | No voltage variation between No.1 and No.2 of CNP103. 1) No variation at 5 pin of IC103. | To check short-cut of coil of PU motor. Mal-contact of connector of CNP103. |
| | 2) No variation at 4 pin of IC102, but variate at 3 pin of IC102. | To check 5 pin of IC102. |
| Tonearm does not descend vertically. | Voltage of more than ± 100 mV generates at 1 pin of output terminal of IC103. | To recheck VR101 |
| Tonearm does not cue down. | 11 pin of IC101 is Heigh for 1 second. | Deffective X106. |
| | 11 pin of IC101 is Low for 1 second. | To adjust stroke of solenoid as 2.2 mm with normal X106. to probe High in input terminals of IC101. |
| No key input | To probe High in input terminals of IC101. | |
| | 1) When High is probed. | To check the parts concerned with terminals of High of IC101. |
| | 2) When High is not probed, it does not accept key input after Cue down. | To adjust to Low when Cueing switch is down. |
| Tonearm always breaks | 5 pin of IC102 is High. | To check outside fixing circuit of 5 pin. |
| | 5 pin of IC102 is Low, but 3 pin of IC102 variates by moving the tonearm by hand. | Deffective IC102. |
| Deviation of Auto-in and Auto-return. | Deviation of sector | To adjust it by eccentric pin Refer to LERD IN ADJUSTMENT |
| Strobe does not light when power is on. | No input of power supply | Deffective fuse 102. |
| Strobe is not bright enough and the tonearm does not move smoothly. | Input voltage of transformer is low. | To confirm change of input voltage and change transformer. |

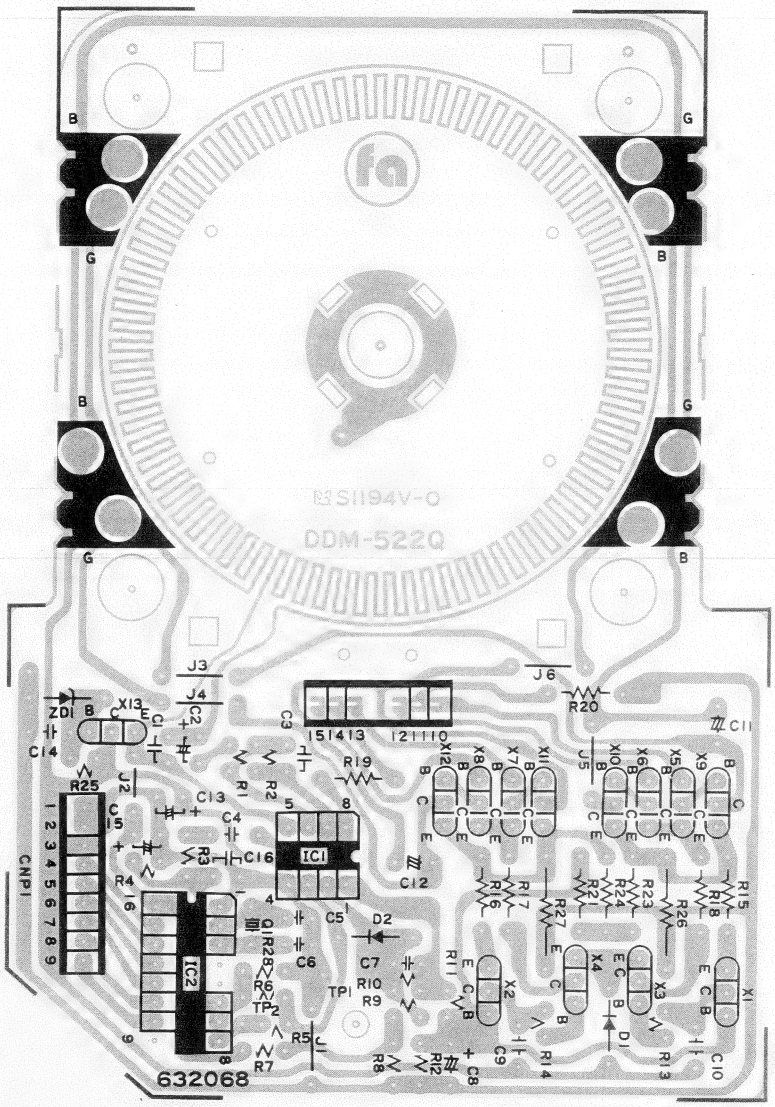
| Symptom | Cause | Procedure |
|---|---|---|
| a) Direct Drive Motor does not rotate or speed is remarkably slow. | a) 1. Transformer or Rectifing circuit is defective. | a) 1. Check voltage between 3 and 2 of CNP 1 of Motor Control Circuit PCB.<br>If 22V is not observed, replace Transformer or Rectifing circuit. |
| | 2. Hall Element is defective. | 2. Check waveform of base signal of between X5 and X6, X7 and X8.<br>Waveform should be<br>  <br><br>If not, hall element is defective, replace Motor Control Circuit PCB. |
| | 3. Transistor X9, X10, X11, X12 or X5, X6, X7, X8 is defective. | 3. Check waveform of collector signal of X9, X10, X11, X12.<br>Waveform should be<br>  <br><br>If the waveform is not observed, check transistors X5, X6, X7, X8, X9, X10, X11, and X12, and replace defective one.<br>The above waveform is to be observed when DC 1V is applied letween 10 of IC1 and ground |
| b) Direct Drive Motor dies not rotate. | b) 1. Direct Drive Motor is defective | b) 1. Check resistance of Motor Winding Wire.<br>(between G and G, B and B)<br>Infinite resistance: Break wire<br>0 resistance: Short wire<br>105 ohm(approx): Normal |
| | 2. IC 1 of Motor Control Circuit PCB is defective. | 2. Check voltage between terminals GND and 10 of IC 1.<br>If 3.66V is not observed, replace IC 1. |
| c) Motor runs(Motor speed is remarkably high) | c) 1. IC 1 or IC 2 is defective. | 1. Check voltage between terminals GND and 1 of IC 1.<br>If voltage fluctuate IC1 or IC2 is normal.<br>No fluctuationi defective IC1 or IC2. |

| Symptom | Cause | Procedure |
|---|---|---|
| | 2. FG pattern is defective, or IC 1 is defective. | 4. Check voltage between terminals GND and 7 of IC 1. Waveform should be   If this waveform is not observed, FG pattern or IC 1 is defective, replace IC 1 or Direct Drive Motor Control circuit PCB. |

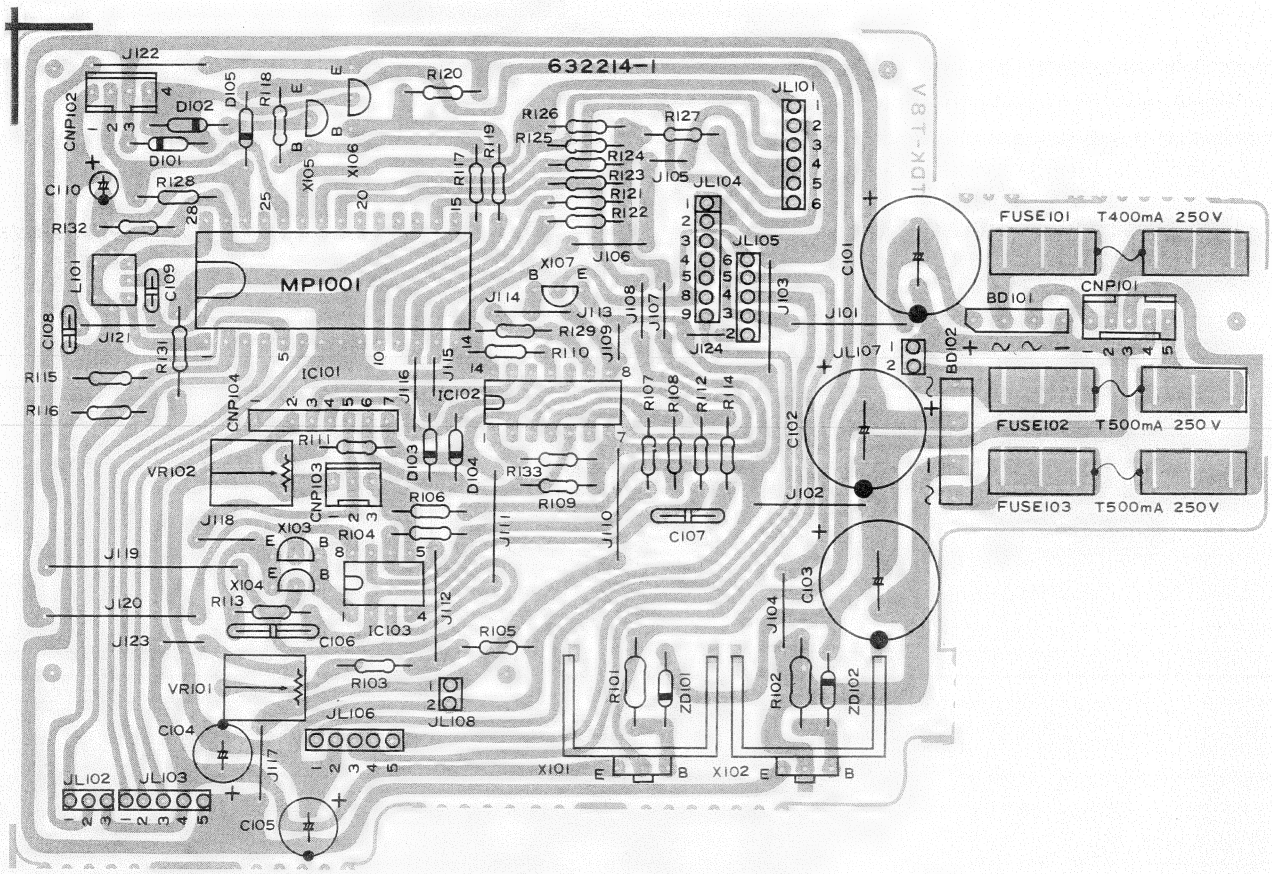
## TOP VIEW OF P.C. BOARD
## FOR MAIN MOTOR CONTROL PCB ASS'Y



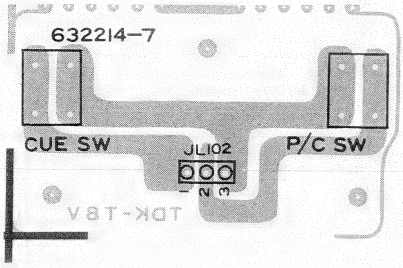
## TOP VIEW OF P.C. BOARD
## FOR MAIN MOTOR CONTROL PCB ASS'Y



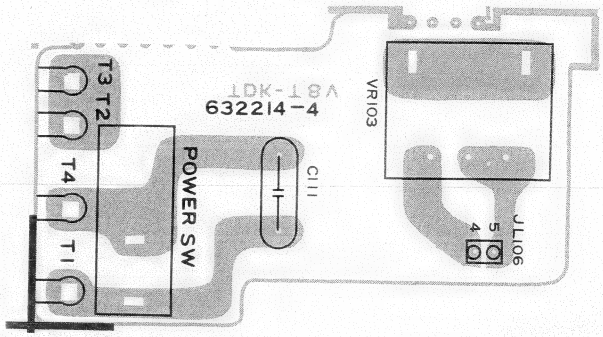
## CONTROL COMPONENT LOCATIONS



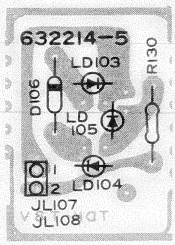
COMPONENT LOCATION FOR CUE, AND PLAY/CUT




COMPONENT LOCATION FOR POWER SWITCH



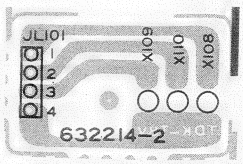

COMPONENT LOCATION FOR
LED OF QUARTZ




COMPONENT LOCATION FOR
LED OF REPEAT


COMPONENT LOCATION FOR LED


COMPONENT LOCATION FOR
AUTOMATIC SENSOR

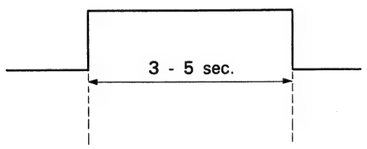


## Voltage of Transistors

| Post. \ Tr. | | $X_{101}$ | $X_{102}$ | $X_{103}$ | $X_{104}$ | $X_{105}$ | $X_{106}$ | $X_{107}$ |
|---|---|---|---|---|---|---|---|---|
| REST | Base | 5.4V | −5.8V | −0.8V | −0.8V | 0V | −14.4V | 0V |
| | Collector | 14.1 | −14.4 | 14.1 | −14.4 | 14.1 | 14.1 | 7.5 |
| | Emitter | 4.8 | −5.2 | 0 | 0 | 0 | −14.4 | 0 |
| PLAYING | Base | 5.4 | −5.8 | −0.8 | −0.8 | 0.5 | −13.2 | 0 |
| | Collector | 12.3 | −13.8 | 12.9 | −13.5 | −0.1 | 0.7 | 10 |
| Cue Down | Emitter | 4.8 | −5.2 | 0 | 0 | −0.2 | −13.7 | 0 |
| PLAYING | Base | 5.4 | −5.8 | −0.8 | −0.8 | 0 | −13.3 | 0 |
| | Collector | 13.5 | −14.2 | 13.7 | −13.8 | 13.3 | 13.4 | 10 |
| Cue Up | Emitter | 4.8 | −5.2 | 0 | 0 | 0 | −13.6 | 0 |

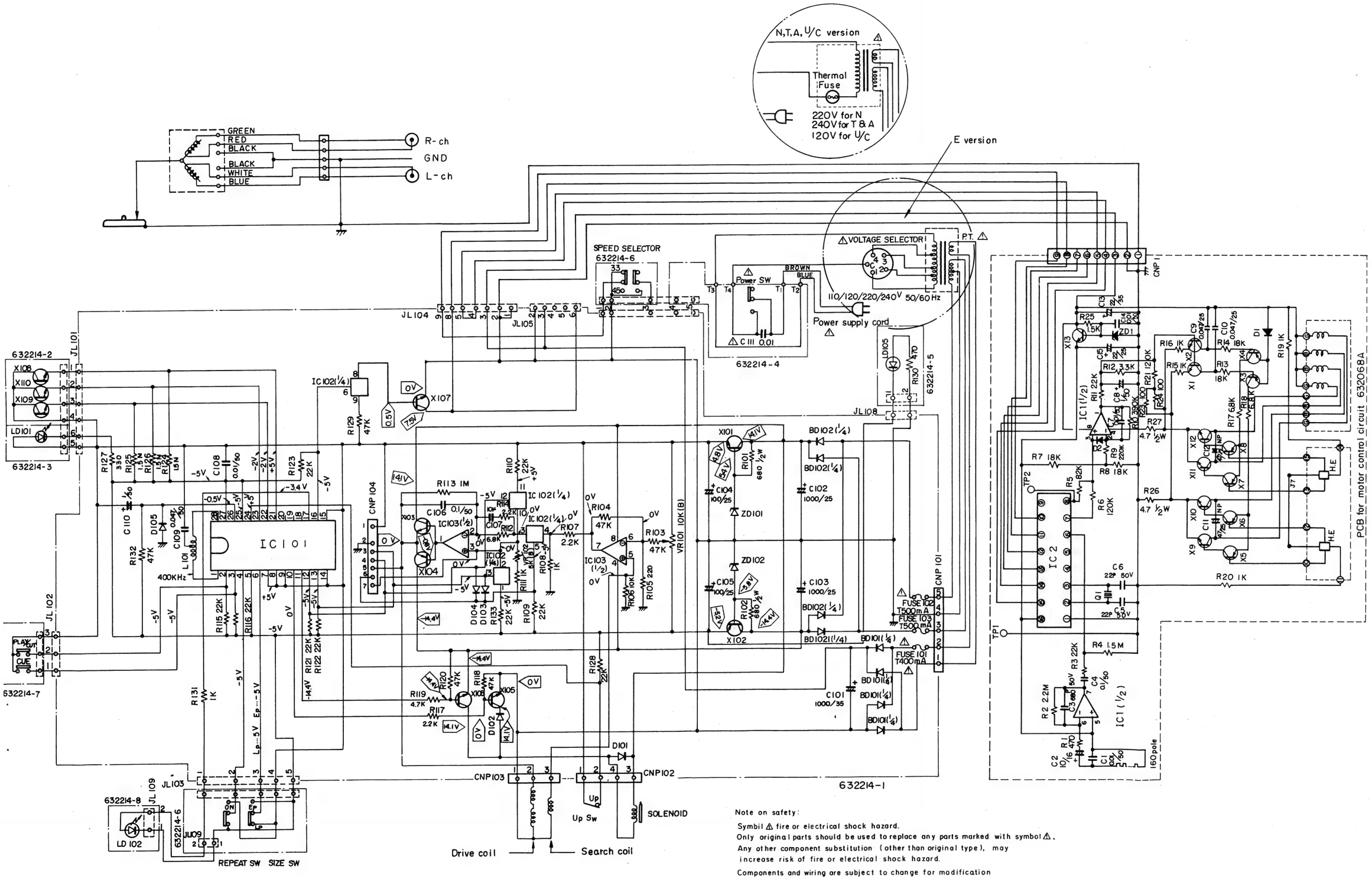
1) Adjustment of VR101 (Offset ad justment of IC103):
   Connect 1 pin and 6 pin of CNP104 and adjust VR101 to make voltage between 2 pin and 5 pin less than ±100mV.

2) Adjustment of VR102 (Adjustment of Arm Speed):
   Adjust VR102 to set the time from 3 sec. to 5 sec. when the tonearm returns from returun position of EP to the arm rest.
   Wave form between 2 pin and 4 pin of CNP104.




2 pin·····Ground

## SCHEMATIC DIAGRAM

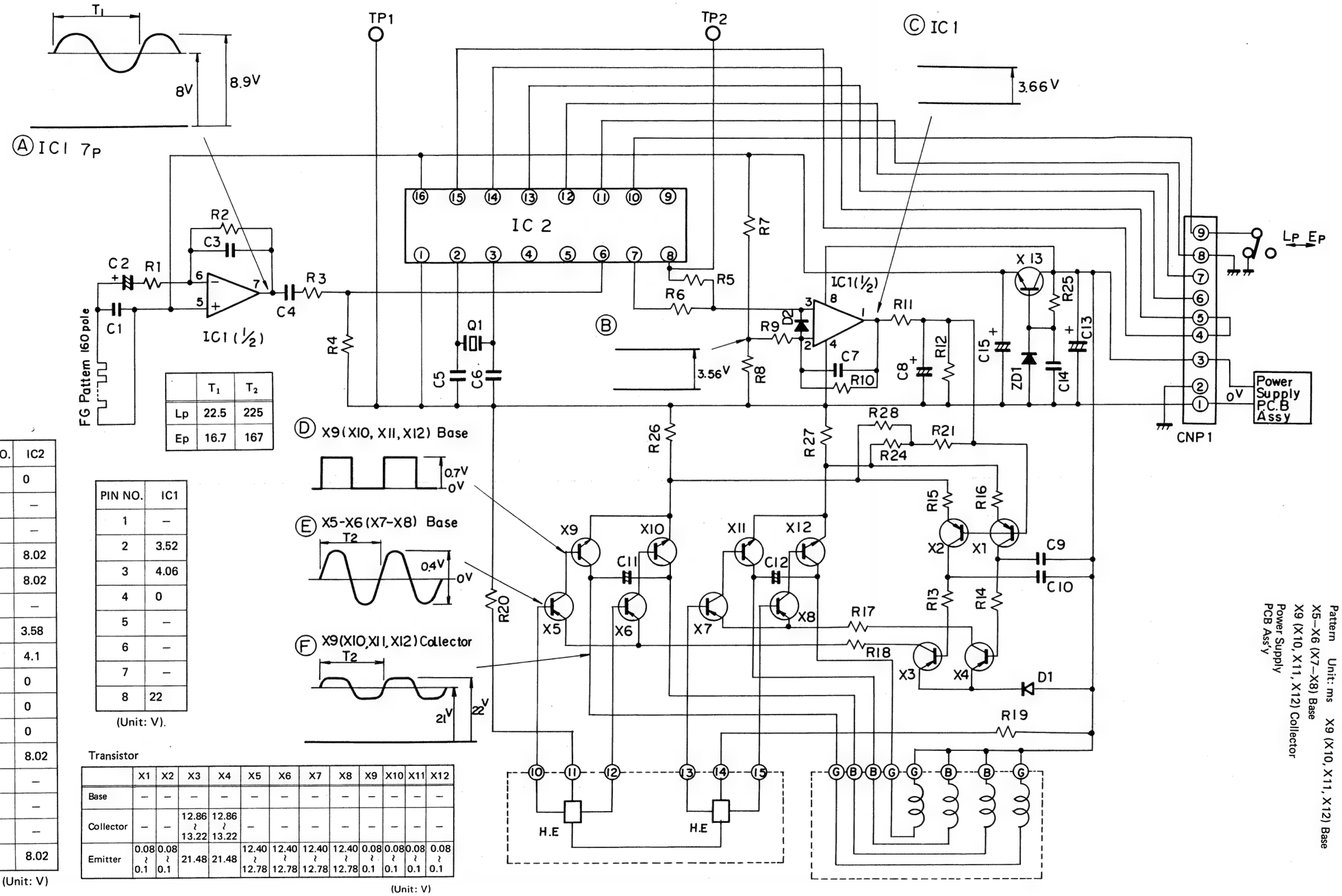



Note on safety:

Symbol ⚠ fire or electrical shock hazard.
Only original parts should be used to replace any parts marked with symbol ⚠.
Any other component substitution (other than original type), may increase risk of fire or electrical shock hazard.

Components and wiring are subject to change for modification without notice.

## SCHEMATIC DIAGRAM MAIN MOTOR CONTROL




| | $T_1$ | $T_2$ |
|---|---|---|
| Lp | 22.5 | 225 |
| Ep | 16.7 | 167 |

| PIN NO. | IC2 |
|---|---|
| 1 | 0 |
| 2 | – |
| 3 | – |
| 4 | 8.02 |
| 5 | 8.02 |
| 6 | – |
| 7 | 3.58 |
| 8 | 4.1 |
| 9 | 0 |
| 10 | 0 |
| 11 | 0 |
| 12 | 8.02 |
| 13 | – |
| 14 | – |
| 15 | – |
| 16 | 8.02 |

(Unit: V)

| PIN NO. | IC1 |
|---|---|
| 1 | – |
| 2 | 3.52 |
| 3 | 4.06 |
| 4 | 0 |
| 5 | – |
| 6 | – |
| 7 | – |
| 8 | 22 |

(Unit: V).

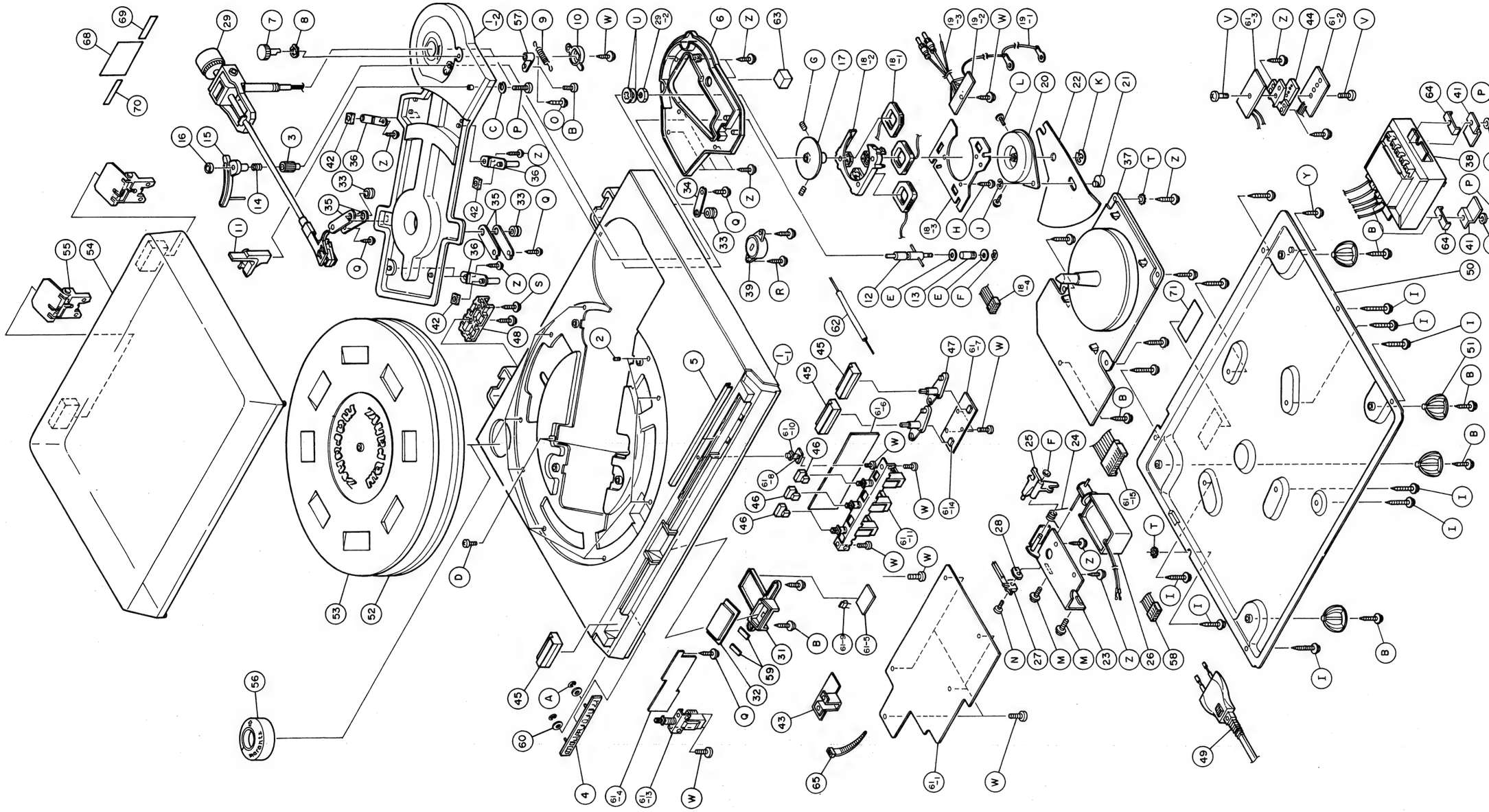
Transistor

| | X1 | X2 | X3 | X4 | X5 | X6 | X7 | X8 | X9 | X10 | X11 | X12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Base | – | – | – | – | – | – | – | – | – | – | – | – |
| Collector | – | – | 12.86 ≀ 13.22 | 12.86 ≀ 13.22 | – | – | – | – | – | – | – | – |
| Emitter | 0.08 ≀ 0.1 | 0.08 ≀ 0.1 | 21.48 | 21.48 | 12.40 ≀ 12.78 | 12.40 ≀ 12.78 | 12.40 ≀ 12.78 | 12.40 ≀ 12.78 | 0.08 ≀ 0.1 | 0.08 ≀ 0.1 | 0.08 ≀ 0.1 | 0.08 ≀ 0.1 |

(Unit: V)

Pattern Unit: ms X9 (X10, X11, X12) Base
X5–X6 (X7–X8) Base
X9 (X10, X11, X12) Collector
Power Supply PCB Ass'y

## EXPLODED VIEW



## PARTS LIST

| REF. DESIG. | PART NO. | QUANTITY E | N | T | A | DESCRIPTION |
|---|---|---|---|---|---|---|
| 1 | 849.1851.nec | 1 | 1 | 1 | 1 | Cabinet Case Ass'y |
| –1 | 849.1831. | | | | | Cabinet Case Not supplied separate |
| –2 | 849.184. | | | | | Mechanism Base supplied separate |
| 2 | 915.2640.nec | 9 | 9 | 9 | 9 | Rubber Cushion |
| 3 | 910.2432.nec | 1 | 1 | 1 | 1 | Base |
| 4 | 896.8381.nec | 1 | 1 | 1 | 1 | Badge |
| 5 | 912.7940.nec | 1 | 1 | 1 | 1 | Decolation Plate |
| 6 | 852.7980.nec | 1 | 1 | 1 | 1 | Sub-base |
| 7 | 912.8040.nec | 1 | 1 | 1 | 1 | Knob |
| 8 | 897.5540.nec | 1 | 1 | 1 | 1 | Washer |
| 9 | 913.0330.nec | 1 | 1 | 1 | 1 | Spring |
| 10 | 912.9930.nec | 1 | 1 | 1 | 1 | Cam |
| 11 | 911.4990.nec | 1 | 1 | 1 | 1 | Rest Ass'y |
| 12 | 899.9812.nec | 1 | 1 | 1 | 1 | Shaft Ass'y (1) |
| 13 | 910.0730.nec | 1 | 1 | 1 | 1 | Spring |
| 14 | 287.6800.nec | 1 | 1 | 1 | 1 | Cam Spring |
| 15 | 899.9361.nec | 1 | 1 | 1 | 1 | Plate |
| 16 | 896.2680.nec | 1 | 1 | 1 | 1 | Elevation Nut |
| 17 | 899.9850.nec | 1 | 1 | 1 | 1 | Disc Plate Ass'y |
| | | | | | | **COIL PCB** |
| 18 | | | | | | |
| –1 | 705.7201.nec | 3 | 3 | 3 | 3 | Coil |
| –2 | 631.9470.nec | 1 | 1 | 1 | 1 | Spool |
| –3 | 912.7960.nec | 1 | 1 | 1 | 1 | Coil PCB |
| –4 | 913.0650.nec | 1 | 1 | 1 | 1 | Connector Ass'y |
| 19 | | | | | | |
| –1 | 913.0670.nec | 1 | 1 | 1 | 1 | Grounding Wire Ass'y |
| –2 | 912.7961.nec | 1 | 1 | 1 | 1 | Coil PCB |
| –3 | 871.4742.nec | 1 | 1 | 1 | 1 | Shielding Wire Ass'y |
| 20 | 912.8911.nec | 1 | 1 | 1 | 1 | Arm Rotor Ass'y (1) |
| 21 | 896.5985.nec | 1 | 1 | 1 | 1 | Eccentric Pin |
| 22 | 899.9573.nec | 1 | 1 | 1 | 1 | Slit Plate |
| 23 | 899.9931.nec | 1 | 1 | 1 | 1 | Angle Ass'y |
| 24 | 899.9941.nec | 1 | 1 | 1 | 1 | Coil Spring |
| 25 | 899.958B.nec | 1 | 1 | 1 | 1 | Lever, Lifter |
| 26 | 911.6123.nec | 1 | 1 | 1 | 1 | Solenoid Ass'y |
| 27 | 899.9960.nec | 1 | 1 | 1 | 1 | Leaf Switch |
| 28 | 910.2940.nec | 1 | 1 | 1 | 1 | Spacer |
| 29 | 852.8130.nec | 1 | 1 | 1 | 1 | Tonearm Ass'y |

| REF. DESIG. | PART NO. | QUANTITY E | N | T | A | DESCRIPTION |
|---|---|---|---|---|---|---|
| 29 | 912.7510.nec | 1 | 1 | 1 | 1 | Cartridge Ass'y MM-81/II |
| | 912.7490.nec | 1 | 1 | 1 | 1 | Stylus (MM) |
| | 852.813H.nec | 1 | 1 | 1 | 1 | Head shell |
| | 852.813W.nec | 1 | 1 | 1 | 1 | Counter Weight |
| | 852.813Z.nec | 1 | 1 | 1 | 1 | Cartridge Screw |
| | 852.813M.nec | 1 | 1 | 1 | 1 | Tonearm |
| –2 | 852.813L.nec | 1 | 1 | 1 | 1 | Arm Nut, LN10 |
| 30 | | | | | | |
| 31 | 873.5460.nec | 1 | 1 | 1 | 1 | LED Case |
| 32 | 912.8051.nec | 1 | 1 | 1 | 1 | Strobe Window |
| 33 | 912.4820.nec | 3 | 3 | 3 | 3 | Rubber Cushion |
| 34 | 912.3143.nec | 1 | 1 | 1 | 1 | Spring Plate |
| 35 | 912.3140.nec | 4 | 4 | 4 | 4 | Spring Plate |
| 36 | 912.1891.nec | 4 | 4 | 4 | 4 | Plate Lock |
| 37 | 632.1720.02n | 1 | 1 | 1 | 1 | Motor DDM-522QM-10 |
| | 632.0680.nec | 1 | 1 | 1 | 1 | PCB |
| IC1 | Z41.2002.61n | 1 | 1 | 1 | 1 | IC, MPC4558 C |
| IC2 | Z41.2008.0ne | 1 | 1 | 1 | 1 | IC, TC9142P |
| X1 | Z41.0410.2ne | 1 | 1 | 1 | 1 | Transistor 2SC945 P |
| X2 | Z41.0410.2ne | 1 | 1 | 1 | 1 | Transistor 2SC945 P |
| X13 | Z41.0410.2ne | 1 | 1 | 1 | 1 | Transistor 2SC945 P |
| X3 | Z41.0010.2ne | 1 | 1 | 1 | 1 | Transistor 2SA733 P |
| X4 | Z41.0010.2ne | 1 | 1 | 1 | 1 | Transistor 2SA733 P |
| X5 | Z41.0010.2ne | 1 | 1 | 1 | 1 | Transistor 2SA733 P |
| X6 | Z41.0010.2ne | 1 | 1 | 1 | 1 | Transistor 2SA733 P |
| X7 | Z41.0010.2ne | 1 | 1 | 1 | 1 | Transistor 2SA733 P |
| X8 | Z41.0010.2ne | 1 | 1 | 1 | 1 | Transistor 2SA733 P |
| Q1 | 705.5340.nec | 1 | 1 | 1 | 1 | HC-18U |
| D1 | Z41.1010.1ne | 2 | 2 | 2 | 2 | DIODE 1S853 |
| D2 | Z41.1011.1ne | 1 | 1 | 1 | 1 | DIODE 1S953 |
| ZD1 | Z41.1209.2ne | 1 | 1 | 1 | 1 | ZD RD9.1E (B1) |
| X9 | Z41.0429.2ne | 1 | 1 | 1 | 1 | Transistor 2SC2001 K |
| X10 | Z41.0429.2ne | 1 | 1 | 1 | 1 | Transistor 2SC2001 K |
| X11 | Z41.0429.2ne | 1 | 1 | 1 | 1 | Transistor 2SC2001 K |
| X12 | Z41.0429.2ne | 1 | 1 | 1 | 1 | Transistor 2SC2001 K |
| C3 | Z40.8361.1sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 50V K 680PF |
| C5 | Z40.8611.7sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 50V K 22PF |
| C6 | Z40.8611.7sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 50V K 22PF |
| C1 | Z40.8382.5sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 50V Z 0.01μF |
| C14 | Z40.8382.5sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 50V Z 0.01μF |

| REF. DESIG. | PART NO. | QUANTITY | | | | DESCRIPTION |
|---|---|---|---|---|---|---|
| | | E | N | T | A | |
| C9 | Z40.8353.3sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 25V Z 0.047 μF |
| C10 | Z40.8353.3sn | 1 | 1 | 1 | 1 | Ceramic Capacitor 25V Z 0.047 μF |
| C7 | Z40.8211.3pn | 1 | 1 | 1 | 1 | Capacitor 50V K 0.01 μF |
| C4 | Z40.8212.5Pn | 1 | 1 | 1 | 1 | Capacitor 50V K 0.1 μF |
| C15 | Z40.8030.5Hn | 1 | 1 | 1 | 1 | Electrolytic 25V 22 μF |
| C8 | Z40.8050.5Hn | 1 | 1 | 1 | 1 | Electrolytic 50V 1.0 μF |
| C2 | Z40.8020.1Hn | 1 | 1 | 1 | 1 | Electrolytic 16V 10 μF |
| C11 | Z40.8605.7Hn | 1 | 1 | 1 | 1 | Electrolytic 25V 47 μF |
| C12 | Z40.8605.7Hn | 1 | 1 | 1 | 1 | Electrolytic 25V 47 μF |
| C13 | Z40.8040.5Hn | 1 | 1 | 1 | 1 | Electrolytic 35V 22 μF |
| R1 | Z40.5026.5AN | 1 | 1 | 1 | 1 | Carbon 470H 5% 1/4W |
| R25 | Z40.5027.7AN | 1 | 1 | 1 | 1 | Carbon 1.5K 5% 1/4W |
| R12 | Z40.5028.5AN | 1 | 1 | 1 | 1 | Carbon 3.3K 5% 1/4W |
| R7 | Z40.5030.3AN | 1 | 1 | 1 | 1 | Carbon 18K 5% 1/4W |
| R8 | Z40.5030.3AN | 1 | 1 | 1 | 1 | Carbon 18K 5% 1/4W |
| R13 | Z40.5030.3AN | 1 | 1 | 1 | 1 | Carbon 18K 5% 1/4W |
| R14 | Z40.5030.3AN | 1 | 1 | 1 | 1 | Carbon 18K 5% 1/4W |
| R3 | Z40.5030.5AN | 1 | 1 | 1 | 1 | Carbon 22K 5% 1/4W |
| R11 | Z40.5030.5AN | 1 | 1 | 1 | 1 | Carbon 22K 5% 1/4W |
| R5 | Z40.5031.9AN | 1 | 1 | 1 | 1 | Carbon 82K 5% 1/4W |
| R6 | Z40.5032.3An | 1 | 1 | 1 | 1 | Carbon 120K 5% 1/4W |
| R9 | Z40.5032.9An | 1 | 1 | 1 | 1 | Carbon 220K 5% 1/4W |
| R10 | Z40.5033.5An | 1 | 1 | 1 | 1 | Carbon 390K 5% 1/4W |
| R4 | Z40.5034.9An | 1 | 1 | 1 | 1 | Carbon 1.5M 5% 1/4W |
| R2 | Z40.5035.3An | 1 | 1 | 1 | 1 | Carbon 2.2M 5% 1/4W |
| R23 | Z40.5044.9An | 1 | 1 | 1 | 1 | Carbon 100H 5% 1/4W |
| R24 | Z40.5044.9An | 1 | 1 | 1 | 1 | Carbon 100H 5% 1/4W |
| R15 | Z40.5047.3An | 1 | 1 | 1 | 1 | Carbon 1.0K 5% 1/4W |
| R16 | Z40.5047.3An | 1 | 1 | 1 | 1 | Carbon 1.0K 5% 1/4W |
| R19 | Z40.5047.3An | 1 | 1 | 1 | 1 | Carbon 1.0K 5% 1/4W |
| R20 | Z40.5047.3An | 1 | 1 | 1 | 1 | Carbon 1.0K 5% 1/4W |
| R17 | Z40.5049.3An | 1 | 1 | 1 | 1 | Carbon 6.8K 5% 1/4W |
| R18 | Z40.5049.3An | 1 | 1 | 1 | 1 | Carbon 6.8K 5% 1/4W |
| R21 | Z40.5052.3An | 1 | 1 | 1 | 1 | Carbon 120K 5% 1/4W |
| R26 | Z40.5800.2Bn | 1 | 1 | 1 | 1 | Carbon 4.7H 5% 1/2% |
| R27 | Z40.5800.2Bn | 1 | 1 | 1 | 1 | Carbon 4.7H 5% 1/2W |
| J1 | 704.8450.nec | 1 | 1 | 1 | 1 | Jumper wire, 0.6x10L |
| J2 | 704.8452.nec | 1 | 1 | 1 | 1 | Jumper wire, 0.6x7.5L |
| J3 | 704.8450.nec | 1 | 1 | 1 | 1 | Jumper wire, 0.6x10L |
| J4 | 704.8450.nec | 1 | 1 | 1 | 1 | Jumper wire, 0.6x10L |

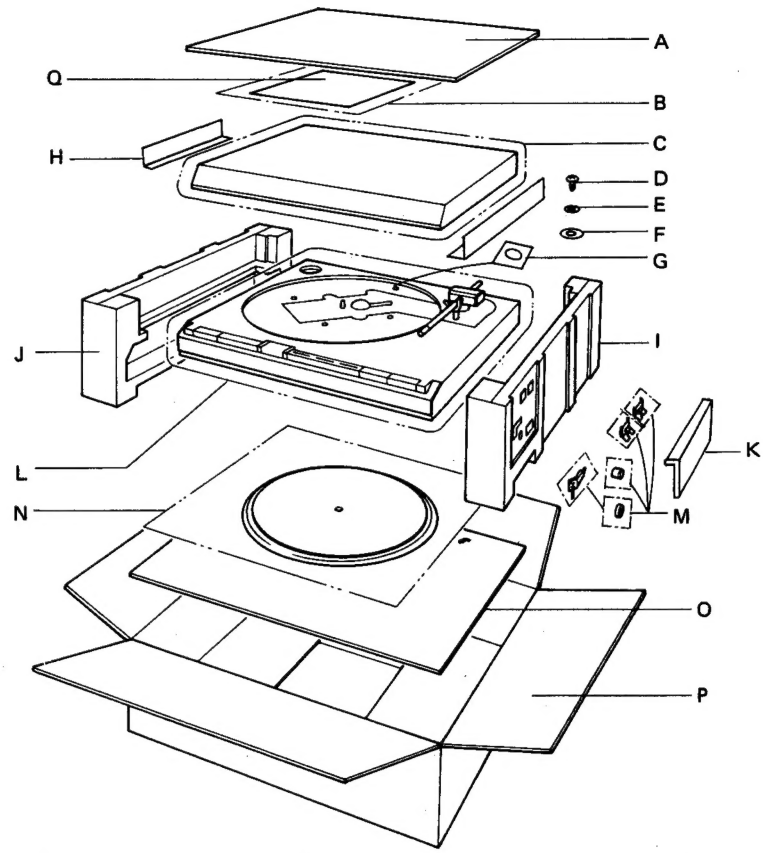
| REF. DESIG. | PART NO. | QUANTITY | | | | DESCRIPTION |
|---|---|---|---|---|---|---|
| | | E | N | T | A | |
| J5 | 704.8450.nec | 1 | 1 | 1 | 1 | Jumper wire, 0.6x10L |
| J6 | 704.8450.nec | 1 | 1 | 1 | 1 | Jumper wire, 0.6x10L |
| CNP1 | Z42.6003.14n | 1 | 1 | 1 | 1 | Connector Post 9PIN |
| TP1 | 706.1670.nec | 1 | 1 | 1 | 1 | Washer-type Pin, 1.0x16L |
| TP2 | 706.1670.nec | 1 | 1 | 1 | 1 | Washer-type Pin, 1.0x16L |
| | 706.3550.nec | 1 | 1 | 1 | 1 | Hole Element |
| 38 | 873.5820.nec | 1 | | | | Power Trance |
| | 873.5960.nec | | 1 | | | Power Trance |
| | 873.5830.nec | | | 1 | 1 | Power Trance |
| 39 | 898.2560.nec | 1 | | | | Switch, Voltage |
| 43 | 912.8890.nec | 1 | 1 | 1 | 1 | Cover, Switch |
| 44 | 899.9561.nec | 1 | 1 | 1 | 1 | Holder, Sensor |
| 45 | 912.8060.nec | 3 | 3 | 3 | 3 | Button |
| 46 | 912.7930.nec | 3 | 3 | 3 | 3 | Button |
| 47 | 912.8830.nec | 2 | 2 | 2 | 2 | Guide, Button |
| 48 | 898.5501.nec | 1 | 1 | 1 | 1 | Holder, Cord |
| 49 | 895.6172.nec | 1 | 1 | | | Power Supply Cord Ass'y |
| | 870.9130.nec | | | 1 | | Power Supply Cord Ass'y |
| 50 | 852.7991.nec | 1 | 1 | 1 | 1 | Botton Lid |
| 51 | 892.2272.nec | 4 | 4 | 4 | 4 | Foot |
| 52 | 620.0792.nec | 1 | 1 | 1 | 1 | Turntable Platter |
| 53 | 871.5581.nec | 1 | 1 | 1 | 1 | Turntable Sheet |
| 54 | 852.6630.nec | 1 | 1 | 1 | 1 | Dust Cover |
| 55 | 912.8840.nec | 2 | 2 | 2 | 2 | Hinge Ass'y |
| 56 | 898.3400.nec | 1 | 1 | 1 | 1 | EP Adaptor |
| 57 | 912.9940.nec | 1 | 1 | 1 | 1 | Lever, I.F.C. |
| 58 | 913.0700.nec | 1 | 1 | 1 | 1 | Connector Ass'y |
| 59 | 912.9540.nec | 2 | 2 | 2 | 2 | Rubber Spacer |
| 60 | 893.2150.nec | 2 | 2 | 2 | 2 | Bush |
| 61 | 620.1280.nec | 1 | 1 | 1 | 1 | Control Circuit Board Ass'y |
| | 706.7000.nec | 1 | 1 | 1 | 1 | Control PCB Ass'y (1) |
| IC101 | 632.0000.nec | 1 | 1 | 1 | 1 | IC |
| IC102 | Z41.2010.2ne | 1 | 1 | 1 | 1 | IC, TC4066 B |
| IC103 | Z41.2002.61n | 1 | 1 | 1 | 1 | IC, MPC4558 C |
| X101 | Z41.0613.1ne | 1 | 1 | 1 | 1 | Transistor 2SD882 Q |
| X102 | Z41.0207.1ne | 1 | 1 | 1 | 1 | Transistor 2SB772 Q |
| X103 | Z41.0607.2ne | 1 | 1 | 1 | 1 | Transistor 2SD667 C |
| X104 | Z41.0204.2ne | 1 | 1 | 1 | 1 | Transistor 2SB647 C |
| X107 | Z41.0410.1ne | 1 | 1 | 1 | 1 | Transistor 2SC945 P |
| X108 | Z41.0814.1ne | 3 | 3 | 3 | 3 | Transistor PN120S |

| REF. DESIG. | PART NO. | QUANTITY E | N | T | A | DESCRIPTION |
|---|---|---|---|---|---|---|
| X109 | Z41.0814.1ne | 3 | 3 | 3 | 3 | Transistor PN120S |
| X110 | | | | | | |
| BD101 | Z41.1004.1ne | 1 | 1 | 1 | 1 | Diode, SIVB10 |
| BD102 | Z41.1003.1ne | 1 | 1 | 1 | 1 | Diode, RB151 |
| ZD101 | Z41.1204.2ne | 2 | 2 | 2 | 2 | Zener Diode RD5.6E (B2) |
| D101 | Z41.1001.3ne | 2 | 2 | 2 | 2 | Diode, F14C |
| D102 | Z41.1020.1ne | | | | | Diode, EM1Z |
| D103 | Z41.1010.1ne | 3 | 3 | 3 | 3 | Diode, 1SS53 |
| LD101 | Z41.1026.0ne | 1 | 1 | 1 | 1 | Diode, SFL2110S (D) |
| LD102 | Z91.2995.nec | 1 | 1 | 1 | 1 | LED (SEL1112R) |
| LD105 | 912.7130.nec | 1 | 1 | 1 | 1 | LED (SEL1124R) |
| VR101 | 704.8258.nec | 1 | 1 | 1 | 1 | Variable Resistor |
| VR102 | 704.8257.nec | 1 | 1 | 1 | 1 | Variable Resistor |
| R101 | Z40.5443.5ne | 2 | 2 | 2 | 2 | Resistor M-OX 680H 5% 1/2W |
| R103 | Z40.5051.3ne | 6 | 6 | 6 | 6 | Carbon Resistor 47K 5% 1/4W |
| R105 | Z40.5045.7ne | 1 | 1 | 1 | 1 | Carbon Resistor 220H 5% 1/4W |
| R106 | Z40.5049.7ne | 1 | 1 | 1 | 1 | Carbon Resistor 6.8K 5% 1/4W |
| R107 | Z40.5048.1ne | 3 | 3 | 3 | 3 | Carbon Resistor 2.2K 5% 1/4W |
| R108 | Z40.5047.3ne | 3 | 3 | 3 | 3 | Carbon Resistor 1.0K 5% 1/4W |
| R111 | | | | | | |
| R131 | | | | | | |
| R109 | Z40.5050.5ne | 9 | 9 | 9 | 9 | Carbon Resistor 22K 5% 1/4W |
| R110 | | | | | | |
| R115 | | | | | | |
| R116 | | | | | | |
| R121 | | | | | | |
| R122 | | | | | | |
| R123 | | | | | | |
| R128 | | | | | | |
| R133 | | | | | | |
| R112 | Z40.5049.3ne | 1 | 1 | 1 | 1 | Carbon Resistor 6.8K 5% 1/4W |
| R113 | Z40.5054.5ne | 1 | 1 | 1 | 1 | Carbon Resistor 1.0M 5% 1/4W |
| R119 | Z40.5048.9ne | 1 | 1 | 1 | 1 | Carbon Resistor 4.7K 5% 1/4W |
| R124 | Z40.5054.9ne | 3 | 3 | 3 | 3 | Carbon Resistor 1.5M 5% 1/4W |
| R125 | | | | | | |
| R126 | | | | | | |
| R127 | Z40.5046.1ne | 1 | 1 | 1 | 1 | Carbon Resistor 1.5M 5% 1/4W |
| R130 | Z40.5046.5ne | 1 | 1 | 1 | 1 | Carbon Resistor 470Ω 5% 1/4W |
| C101 | Z40.8601.2ne | 1 | 1 | 1 | 1 | 35V 1000 μF |
| C102 | Z40.8600.9n e | 2 | 2 | 2 | 2 | 25V 1000 μF |

| REF. DESIG. | PART NO. | QUANTITY E | N | T | A | DESCRIPTION |
|---|---|---|---|---|---|---|
| C103 | Z40.8600.9ne | | | | | 25V 1000 μF |
| C104 | Z40.8030.9ne | 2 | 2 | 2 | 2 | Electrolytic 25V 100 μF |
| C105 | Z40.8030.9ne | | | | | Electrolytic 25V 100 μF |
| C106 | Z40.8212.5ne | 1 | 1 | 1 | 1 | Capacity 50VZ 0.01 μF |
| C108 | Z40.8382.5ne | 1 | 1 | 1 | 1 | Ceramic Capacitor 50VZ 0.01 μF |
| C109 | Z40.8382.1ne | 1 | 1 | 1 | 1 | Ceramic Capacitor 50VZ 4700PF |
| C110 | Z40.8050.5ne | 1 | 1 | 1 | 1 | Electrolytic 50V 1.0 μF |
| C107 | Z40.8612.3ne | 1 | 1 | 1 | 1 | Electrolytic 25V 10 μF NP |
| C111 | 899.2992.nec | 1 | 1 | 1 | 1 | Capacitor |
| L101 | 706.2950.nec | 1 | 1 | 1 | 1 | 400KHz |
| | 912.5950.nec | 2 | 2 | 2 | 2 | Switch |
| | 912.8900.nec | 1 | 1 | 1 | 1 | Push Switch. (SUN302A) REPEAT, SIZE, SPEED |
| | 910.6731.nec | 1 | 1 | 1 | 1 | Power Switch (SDL) |
| FUSE101 | 893.7911.nec | 1 | 1 | 1 | 1 | Fuse |
| EUSE102 | 892.1710.nec | 2 | 2 | 2 | 2 | Fuse |
| FUSE103 | 893.3950.nec | 6 | 6 | 6 | 6 | Fuse Holder |
| | 911.3810.nec | 2 | 2 | 2 | 2 | Heat Sink Ass'y |
| | Y10.3008.03n | 2 | 2 | 2 | 2 | Screw + 3x8 |
| JL104 | 706.7010.nec | 1 | 1 | 1 | 1 | Lead Wire Ass'y |
| CNP101 | 706.0335.nec | 1 | 1 | 1 | 1 | Connector Post PIN |
| CNP102 | 706.0334.nec | 1 | 1 | 1 | 1 | Connector Post 4PIN |
| CNP103 | 706.0333.nec | 1 | 1 | 1 | 1 | Connector Post 3PIN |
| CNP104 | 399.2532.nec | 1 | 1 | 1 | 1 | Connector Post 7PIN |
| 62 | W42.9490.82n | 1 | | | | UL tube 1617 #22 L490 |
| 63 | 890.4324.nec | 1 | 1 | 1 | 1 | Spacer |
| 64 | 913.1840.nec | 2 | 2 | 2 | 2 | Holder Transformer |
| 65 | 894.4080.nec | 9 | 7 | 7 | 7 | Wire Fastener |
| 66 | | | | | | |
| 67 | | | | | | |
| 68 | 913.0740.nec | 1 | | | | Rating Label |
| | 913.0741.nec | | | 1 | | Rating Label |
| | 913.0744.nec | | 1 | | | Rating Label |
| 69 | 911.0140.nec | 1 | 1 | 1 | | Japan Label |
| 70 | 892.6740.nec | 1 | 1 | 1 | 1 | Number Label |
| 71 | 893.3890.nec | 1 | 1 | 1 | 1 | Caution Label |
| A | Y37.0000.01n | 2 | 2 | 2 | 2 | CS Stopper |
| B | Y09.3008.01n | 4 | 4 | 4 | 4 | Washer Type Screw 3x8 |
| C | Y31.0003.01n | 1 | 1 | 1 | 1 | Spring Washer |
| D | Y10.3016.01n | 1 | 1 | 1 | 1 | Screw 3x16 |
| E | 912.1130.nec | 2 | 2 | 2 | 2 | Washer |

| REF. DESIG. | PART NO. | QUANTITY | | | | DESCRIPTION |
|---|---|---|---|---|---|---|
| | | E | N | T | A | |
| F | Y34.0002.01n | 2 | 2 | 2 | 2 | E-ring |
| G | Y12.3003.01n | 2 | 2 | 2 | 2 | Screw |
| H | Y08.3016.04n | 3 | 3 | 3 | 3 | Washer Type Screw ⊕ 3x16 |
| I | Y09.3010.02n | 15 | 15 | 15 | 15 | Washer Type Screw ⊕ 3x10 |
| J | Y34.0003.02n | 1 | 1 | 1 | 1 | Bow E-3 Washer |
| K | Y34.0010.02n | 1 | 1 | 1 | 1 | Bow E-10 Washer |
| L | Y21.3008.01n | 2 | 2 | 2 | 2 | Bolt 3x6 |
| M | Y01.3004.04n | 2 | 2 | 2 | 2 | Screw 3x4 |
| N | Y01.6050.01n | 1 | 1 | 1 | 1 | Screw ⊕ 2.6x5 |
| P | Y10.2020.01n | 3 | 3 | 3 | 3 | Screw ⊕ 3x16 |
| Q | 912.2900.nec | 10 | 10 | 10 | 10 | Washer Type Screw |
| S | Y09.3016.02n | 2 | 2 | 2 | 2 | Washer Type Screw ⊕ 3x16 |
| T | Y41.0003.02n | 2 | 2 | 2 | 2 | Washer |
| U | Y37.0010.01n | 2 | 2 | 2 | 2 | CS-Stopper |
| W | Y10.3008.01n | 16 | 16 | 16 | 16 | Screw ⊕ 3x8 |
| Y | Y10.3016.02n | 1 | 1 | 1 | 1 | Screw ⊕ 3x16 |
| Z | Y09.301.02n | 19 | 19 | 19 | 19 | Washer Type Screw ⊕ 3x12 |

## PACKING MATERIALS




| REF. DESIG. | PART NO. | QUANTITY | | | | DESCRIPTION |
|---|---|---|---|---|---|---|
| | | E | N | T | A | |
| A,H,K, Q & P | 852.8012.nec | 1 | 1 | 1 | 1 | Packing Case with reinforcement (1 pc each A,O & P,2 pcs each H & K) |
| " | 852.9320.nec | | | | | " |
| " | 852.8014.nec | 1 | 1 | 1 | 1 | " |
| B | Z63.2303.40n | 1 | 1 | 1 | 1 | Polyethy Bag, 230 x 340L |
| C | 913.3840.nec | 1 | 1 | 1 | 1 | Foamed Plastic Bag |
| D | Y08.4030.04n | 4 | 4 | 4 | 4 | Transportation Screw, ±4 x 30 |
| E | Y64.2120.08n | 4 | 4 | 4 | 4 | Washer, Iron 4.2 x 12 x 0.8 |
| F | 890.8160.nec | 4 | 4 | 4 | 4 | Caution Tag |
| G | 913.3340.nec | 1 | 1 | 1 | 1 | Lock Caution Tag |
| I | 852.800R.nec | 1 | 1 | 1 | 1 | Cushion |
| J | 852.800L.nec | 1 | 1 | 1 | 1 | Cushion |
| L | 891.264-1.nec | 1 | 1 | 1 | 1 | Foamed Plastic Sheet |
| M | Z63.0701.20n | 5 | 5 | 5 | 5 | Polyethy Bag, 70 x 120L |
| N | Z63.3405.70n | 1 | 1 | 1 | 1 | Polyethy Bag, 340 x 570L |